REMARKS

Herein, the "Action" or "Office Action" refers to the Office Action dated 11/02/2004.

Applicant respectfully requests reconsideration and allowance of all of the claims of the application. Claims 1, 3-8, 10-16, and 18-23 are presently pending. Claims amended herein are 1, 8, and 16. Claims withdrawn or cancelled herein are 2, 9 and 17. New claims added herein are none .

Substantive Claim Rejections

Claim Rejections under §103

The Office rejects all of the pending claims under §103. For the reasons set forth below, the Office has not shown made a *prima facia* case showing that the rejected claims are obvious (under §103). Accordingly, Applicant respectfully requests that the rejections be withdrawn and the case be passed along to issuance.

The Office's rejections are based upon the following references:

- **Krishnan**: *Krishnan et al.*, US Patent No. 6,141,698 (issued 10/31/2000); and/or
- **Arendt**: *Arendt et al.*, US Patent No. 5,708,811 (issued 1/13/1998).

Overview of the Application

The Application describes a technology for for operating systems and loaders of executable images. Furthermore, the technology facilitates the adoption and recognition by an operating system of an otherwise unsupported executable-image format. It may do so by increasing the ease with which an executable-

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image loader may be modified to accommodate for the otherwise unsupported executable-image format.

For various reasons (e.g., promotion of backward compatibility or cross-platform compatibility), it is desirable for an operating system (OS) to load and execute otherwise non-native executable images. Such images have an otherwise unsupported format. The conventional approach is to modify the native loader (of the native OS) so that the native loader will recognize the otherwise unsupported format of an image and load it. Because of these modifications, a loader of such an OS is littered with hard code designed to identify, locate, map, and search out various formats of non-native images.

Conventionally, modifying the loader of an operating system (OS) in the manner described above is labor-intensive and time-consuming. It also requires programmers with an extraordinarily high skill level to successfully modify a loader appropriately.

Also, it may be desirable for an OS to support the execution of images from multiple platforms by using a simulator/emulator. It might be impractical to know before shipping the OS what type of application that a user might simulate/emulate. With the exemplary extensible loader, if one installs a custom simulator/emulator, one can also install a customized loader to extend OS features on the fly (i.e., without extensive loader redesign by a high level programming team—like that of the OS manufacturer).

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Cited References

The Office cites **Krishnan** as its primary references in its obviousness-based rejections. The Office cites **Arendt** as its secondary reference in its obviousness-based rejection.

Krishnan

Krishnan describes a technology for modifying the behavior of existing executable code by injecting new code into an executable file is provided. The injection mechanism injects a reference to new code contained in a DLL into an existing executable file such that, when the code of the executable file is executed, the DLL is automatically loaded and the new code is automatically executed. A reference to the DLL is injected into the executable file by either modifying an import table of the file, which causes automatic loading of the DLLs referred to therein, or by adding DLL loader code to the file. The DLLs loader code uses an underlying operating system call to load the DLL. Further, the injection mechanism provides enhanced security by injecting security code and data into the executable file. The injected security code mechanism uses an incremental encryption and decryption process to encrypt and decrypt portions of the executable file in a more secure manner.

Arendt

Arendt describes a technology for lazy loading of executable library objects. It reduces operating system overhead and memory commitment requirements by postponing object loading until object references are expected.

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Initial task loading allocates only the main executable and library objects referenced by that executable. Secondary referenced objects are not allocated.

Object references cause page faults for allocated but not loaded pages. Page fault handling causes loading and fix up of executable objects. Page fault handling also determines the next level of object references and allocates memory for the next object level. Shared memory systems allow sharing of executable objects until explicitly referenced. Once referenced, memory fault causes copying and fixup to referencing task memory area.

Obviousness Rejections

Lack of *Prima Facie* Case of Obviousness (MPEP § 2142)

Applicant disagrees with the Office's obviousness rejections. Arguments presented herein point to various aspects of the record to demonstrate that all of the criteria set forth for making a *prima facie* case have not been met.

Based upon Krishnan and Arendt

The Office rejects all pending claims (1-23) under USC § 103(a) as being unpatentable over **Krishnan** as modified by **Arendt**. Applicant respectfully traverses the rejections of these claims. Applicant asks the Office to withdraw its rejection of these claims.

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Claim 1

In its rejection of this claim, the Office states the following on pages 2 and 3 of the Action:

Regarding claim 1, Krishnan discloses: A computer-readable medium having computer-executable modules comprising:

a file locator configured to locate an executable image on a computer media (col. 6, lines 11-15, Krishnan);

a memory-mapper configured to open the executable image from the computer media and read it into a computer memory (col. 6, lines 60-65, Krishnan);

an importer configured to find a list of executable image names to load;

a binder configured to link multiple executable images together, such images being those of the list of executable image names ((col. 7, lines 48 to col. 8, lines 5, Krishnan).

However, Krishnan didn't disclose: a file-format recognizer configured to recognize the file format of the executable image from amongst a database of multiple file format definitions ; an exporter configured to build a representation of program modules that an executable image exports. On the other hand, Arendt discloses: a file-format recognizer (loader) configured to recognize the file format of the executable image from amongst a database of multiple file format definitions (col. 4, lines 12-18, Arendt); an exporter configured to build a representation of program modules that an executable image exports (col. 5, lines 22-30, Arendt). Thus, at the time invention was made, it would have been obvious to a person of ordinary skill in the art to include a file-format recognizer and an exporter configured to build a representation of program modules in the system of Krishnan as taught by Arendt. The motivation being to the operating system recognizes the format of executable images and executes the program modules for managing allocation of memory and loading the executable file into memory.

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Applicant amends this claim so that it now recites, in part, the following: "a file-format recognizer configured to recognize the file format of the executable image from amongst a database of multiple file format definitions, wherein the database is extensible so that additional file format definitions may be added to the database of multiple file format definitions."

Applicant submits that the combination of **Krishnan** and **Arendt** does not disclose this recited elements and features. More specifically, neither reference discloses an extensible database "of multiple file format definitions" where "additional file format definitions may be added."

This extensible database feature was originally recited in claim 2. In its rejection of claim 2, the Office states the following on page 3 of the Action:

> Regarding claim 2, all the limitations of this claim have been noted in the rejection of claim 1 above. In addition, Krishnan/Arendt discloses: wherein the database is extensible so that additional file format definitions may be added to the database of multiple file format definitions (col. 6, lines 7-15, Krishnan).

The recited portion of **Krishnan** (col. 6, lines 7-15) says this:

> Because the injection mechanism injects a reference to a new DLL and optionally injects security code by adding code into an existing executable file, the injection mechanism needs to have knowledge of the different executable file formats it wishes to manipulate. Although the mechanism itself operates independently of the executable file format, the injection mechanism needs to be aware of the file format in order to determine the proper locations at which references or code should be added.

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Applicant submits that the recited portion of **Krishnan** (col. 6, lines 7-15) discusses and discloses a general desirability of having a knowledge or an awareness of different executable file formats. However, it does not expressly disclose, teach, or suggest extending its set of known formats via an extensible database of file format definitions. Applicant submits that a general statement about desirability for the **Krishnan** to know the file formats on which it operates is not equivalent to disclosing a functioning and enabled extensible database of file format definitions.

Therefore, Applicant submits that combination of **Krishnan** and **Arendt** does not disclose an extensible database "of multiple file format definitions" where "additional file format definitions may be added." Accordingly, Applicant respectfully asks the Office to withdraw its rejection.

Claims 3-7

These claims ultimately depend upon independent claim 1. As discussed above, claim 1 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

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Claim 8

In its rejection of this claim, the Office states the following on page 4 of the Action:

> Regarding claim 8, Krishnan/Arendt discloses: A computer-readable medium having computer-executable modules comprising: a searcher configured (injection mechanism) to search a computer media (space) for an executable image (301, fig. 3, Krishnan) for loading (col. 7, lines 22-27, Krishnan);
>
> a format recognizer configured to the format of the executable image (col. 6, lines 20-27, Krishnan);
>
> a memory-mapper configured to load and map the executable image into memory based upon the format of the executable image (col. 6, lines 60-65, Krishnan);
>
> a sub-loader configured to examine a data structure of the executable image to determine whether to load additional images (col. 7, lines 60 to col. 8, lines 1, Krishnan);
>
> a database of multiple executable-image formats which is the basis for which the recognizer recognizes the format of executable image (col. 4, lines 12-18, Arendt) and for which the memory-mapper varies how it loads and maps the executable image into memory (col. 4, lines 66 to col. 5, lines 5, Arendt).

Applicant amends this claim so that it now recites, in part, the following: "a database of multiple executable-image formats which is the basis for which the recognizer recognizes the format of executable image and for which the memory-mapper varies how it loads and maps the executable image into memory, wherein the database is extensible so that additional executable-image formats may be recognized by the recognizer and loaded and mapped by the memory-mapper."

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Applicant submits that the combination of **Krishnan** and **Arendt** does not disclose this recited element and features. More specifically, neither reference discloses an extensible database "of executable-image formats" where "additional executable-image formats may be recognized by the recognizer and loaded and mapped by the memory-mapper."

This extensible database feature was originally recited in claim 9. In its rejection of claim 2, the Office states the following on pages 4 and 5 of the Action:

> Regarding claim 9, all the limitations of this claim have been noted in the rejection of claim 8 above. In addition, Krishnan/Arendt discloses: wherein the database is extensible so that additional executable-image formats may be recognized by the recognizer (loader) and loaded and mapped by the memory-mapper (col. 4, lines 12-18, Arendt).

The recited portion of **Arendt** (col. 4, lines 12-18) says this:

> Each executable module is stored in permanent storage (for example, on the hard disk) in a specified format. In the preferred embodiment, the main executable file and all dynamic link libraries are stored according to the "LX--Linear Executable Module" format. Storage formats could differ between the main executable and the dynamic link libraries or even within the dynamic link libraries as long as all formats are recognizable by the loader.

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Applicant submits that the recited portion of **Arendt** (col. 4, lines 12-18) discusses and discloses a general desirability to be able to recognize different "storage formats" for the main executable and the DLLs. However, it does not expressly disclose, teach, or suggest extending a set of known formats via an extensible database of "storage formats" definitions. Applicant submits that a general statement about desirability for the **Arendt** to recognize different "storage formats" is not equivalent to disclosing a functioning and enabled extensible database of executable-image formats.

Therefore, Applicant submits that combination of **Krishnan** and **Arendt** does not disclose an extensible database "of executable-image formats" where "additional executable-image formats may be recognized by the recognizer and loaded and mapped by the memory-mapper." Accordingly, Applicant respectfully asks the Office to withdraw its rejection.

Claims 10-15

These claims ultimately depend upon independent claim 8. As discussed above, claim 8 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

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Claim 16

In its rejection of this claim, the Office states the following on page 6 of the Action:

> Regarding claim 16, all the limitations of this claim have been noted in the rejection of claims 1 and 8. It is therefore rejected as set forth above. In addition, Krishnan/Arendt discloses:
>
> investigating information related to the executable image, thereby identifying the format of the executable image (col. 4, lines 37-55, Krishnan);

Applicant amends this claim so that it now recites, in part, the following: "investigating information related to the executable image, thereby identifying the format of the executable image, wherein during the investigating, an extensible database of executable-image formats is accessed."

Applicant submits that the combination of **Krishnan** and **Arendt** does not disclose this recited element and features. More specifically, neither reference discloses an access to an extensible database "of executable-image formats."

This extensible database feature was originally recited in claim 17. In its rejection of claim 17, the Office states the following on page 6 of the Action:

> Regarding claim 17, all the limitations of this claim have been noted in the rejection of claim 16 above. In addition, Krishnan/Arendt discloses: wherein during the investigating an extensible database of executable-image formats is accessed (col. 4, lines 61-63, Krishnan).

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The recited portion of **Krishnan** (col. 4, lines 61-63) says this:

> The licensing developer creates a new DLL with the new licensing code accessible through the initialization function of the DLL.

Applicant submits that the recited portion of **Krishnan** (col. 4, lines 61-63) discusses and discloses a general desirability of using "new DLLs." However, it does not expressly disclose, teach, or suggest employing an extensible database of executable-image formats. Accordingly, Applicant respectfully asks the Office to withdraw its rejection.

Claims 18-20

These claims ultimately depend upon independent claim 16. As discussed above, claim 16 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

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Claim 21

In its rejection of this claim, the Office states that all of the limitations of this claim have been noted in the rejection of claims 1 and 2 above. If so, then Applicant submits that this claim is allowable for the same reasons stated above for claim 1 being allowable.

Claims 22 and 23

These claims ultimately depend upon independent claim 21. As discussed above, claim 21 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

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Dependent Claims

In addition to its own merits, each dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each dependent claim where its base claim is allowable.

Conclusion

All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application. If any issues remain that prevent issuance of this application, the Office is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

Dated: 3-2-05 By: _____

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